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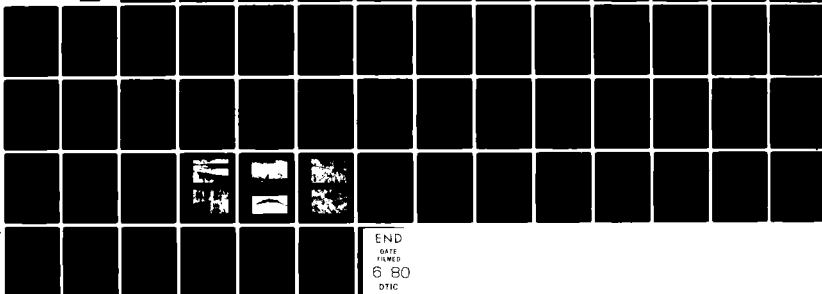
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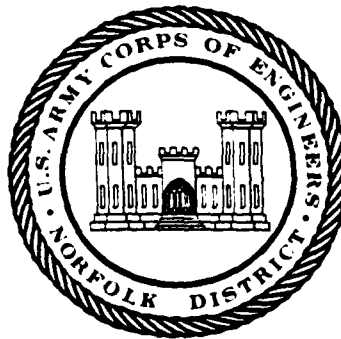
POTOMAC RIVER BASIN

Name of Dam: South River No. 26
Location: Augusta County, State of Virginia
Inventory Number: VA 01501

LEVEL II

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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PREPARED FOR
NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

PREPARED BY
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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic/hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam and appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition, and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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NAME OF DAM: SOUTH RIVER No. 26

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: South River No. 26
State: Virginia
County: Augusta
USGS 7.5 Minute Quadrangle: Waynesboro West, VA
Stream: Inch Branch
Date of Inspection: 27 November 1979

BRIEF ASSESSMENT OF DAM

South River No. 26 dam is an earthfill dam approximately 760 feet long and 57.4 feet high with a 100 foot wide vegetated earth emergency spillway. The principal spillway is a drop-inlet structure consisting of a concrete riser and a corrugated metal outlet pipe encased in concrete. The dam, located approximately 3 miles south of Waynesboro, Virginia, is used for recreation by the owners and for flood control. The dam is owned by a group of private citizens. South River No. 26 dam is an "intermediate" size - "high" hazard structure as defined by the Recommended Guidelines for Safety Inspection of Dams.

Using the Corps of Engineers' screening criteria for initial review of spillway adequacy, the Probable Maximum Flood (PMF) was selected as the spillway design flood (SDF). The SDF was routed through the reservoir and found to overtop the dam by a maximum depth of 1.6 feet with an average critical velocity of 5.9 f.p.s. Total duration of dam overtopping would be approximately 2.8 hours. The spillway is capable of passing up to 50 percent of the PMF. The spillway is adjudged as inadequate, but not seriously inadequate.

Since there are several homes in the damage area, a flood warning system and emergency action plan should be developed and put into operation. A stability check on the dam is required. Visual inspection and office analyses indicate no deficiencies requiring emergency attention.

The following repair items should be completed as part of the general maintenance of the dam:

- 1) Excavate, fill, and compact the animal burrows.
- 2) Grade and seed all areas of erosion on the embankment and abutments.

NAME OF DAM: SOUTH RIVER No. 26

3) Remove the fallen trees along the toe.

4) Replace the staff gages.

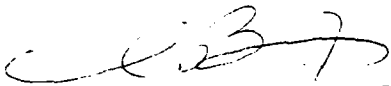
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Chief Executive Officer

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APPROVED:

Douglas L. Haller
Colonel, Corps of Engineers
District Engineer

MAY 3 1980

Date: _____



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NAME OF DAM: SOUTH RIVER No. 26



OVERALL VIEW OF DAM

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM: SOUTH RIVER No. 26 ID# VA 01501

SECTION 1 - PROJECT INFORMATION

1.1 General

- 1.1.1 Authority: Public Law 92-367, 8 August 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of safety inspections of dams throughout the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.
- 1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams. The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

1.2 Description of Project

- 1.2.1 Description of Dam and Appurtenances: South River No. 26 is an earthfill embankment approximately 760 feet long and 57.4 feet high¹. The crest is approximately 18 feet wide. The dam was constructed with side slopes of 2.5H:1V (Horizontal to Vertical) on both the upstream and downstream slopes. A 10 foot berm was provided on the upstream face of the embankment at elevation 1433.0 feet Mean Sea Level (M.S.L.), 1.0 foot above the normal pool elevation of 1432.0 feet M.S.L. A 10 foot berm was also provided on the downstream face at elevation 1442.6 feet M.S.L. Seepage control is provided by an impervious core, a keyway, and a toe drain. The toe drain consists of an 8 inch perforated corrugated metal pipe surrounded by a porous filter of river run sand and gravel. The toe drain discharges into the left² side of the stilling basin for the principal spillway.

¹Measured from streambed at toe of dam to the embankment crest.

²Facing downstream.

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NAME OF DAM: SOUTH RIVER No. 26

The principal spillway is a standard Soil Conservation Service (SCS) drop-inlet structure consisting of a reinforced concrete riser approximately 14 feet high with a 24 inch corrugated metal outlet pipe encased in concrete. The outlet pipe is 305 feet long and is fitted with 5 reinforced concrete anti-seep collars on 32 foot centers as it passes through the embankment. The outlet discharges into a riprapped stilling basin.

The emergency spillway, a 100 foot wide vegetated earth channel, is located outside the right abutment of the dam. The approach channel of the emergency spillway rises at a slope of 3 percent to the control section. Below the level 25 foot long control section, the slope of the discharge channel is approximately 5 percent.

The riser is a drop-inlet structure with a fixed crest at elevation 1432.0 feet M.S.L. An 18 inch diameter reservoir drain is located on the upstream face of the riser. The drain has an invert elevation of 1418.67 feet M.S.L. and is fitted with a manually operated slide head gate.

- 1.2.2 Location: South River No. 26 dam is located on Inch Branch, a tributary of Back Creek, approximately 3 miles south of Waynesboro, Augusta County, Virginia. A Location Plan is included in Appendix I.
- 1.2.3 Size Classification: The maximum height of the dam is 57.4 feet and the reservoir storage capacity at the crest of the dam (elevation 1467.4 feet M.S.L.) is 868 acre-feet. Therefore, the dam is in the "intermediate" size category as defined by the Recommended Guidelines for Safety Inspection of Dams.
- 1.2.4 Hazard Classification: Several residences are located within the first two miles of the downstream floodplain. Loss of human life is highly probable in the event of dam failure by overtopping. For this reason, South River No. 26 dam is classified in the "high" hazard category according to the Recommended Guidelines for Safety Inspection of Dams. The hazard classification used to categorize dams is a function of location only and has nothing to do with its stability or probability of failure.

NAME OF DAM: SOUTH RIVER No. 26

- 1.2.5 Ownership: The dam is owned jointly by several private citizens. The contact is Mr. J.S. Bosserman, Route 3, Staunton, Virginia 24401.
- 1.2.6 Purpose of Dam: The dam is used for flood control within the South River watershed and for recreation by the owners.
- 1.2.7 Design and Construction History: The existing facility was designed by the SCS. Construction was completed in 1956.
- 1.2.8 Normal Operational Procedures: This reservoir is normally operated at the level of the fixed crest on the principal spillway riser, elevation 1432.0 feet M.S.L. No formal operating procedures are followed for this structure. See Paragraph 4.1 for detailed operating procedures.

1.3 Pertinent Data

- 1.3.1 Drainage Area: The drainage area tributary to the dam is 2.33 square miles.
- 1.3.2 Discharge at Dam Site: Maximum discharge at the dam site is unknown.

Principal Spillway
Pool level at top of dam . . . 73 c.f.s.

Emergency Spillway
Pool level at top of dam . . . 6310 c.f.s.

- 1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir are shown in the following table:

TABLE 1.1 DAM AND RESERVOIR DATA

Item	Elevation feet M.S.L.	Area acres	Reservoir Capacity		Length feet
			Acre- feet	Watershed inches	
Top of dam	1467.4	39.2	868	6.9	2880
Emergency spillway crest	1460.5	33.4	618	4.9	2740
Principal spillway crest (normal pool)	1432.0	8.8	58	0.5	950
Streambed at downstream toe of dam	1410.0	-	-	-	-

NAME OF DAM: SOUTH RIVER No. 26

SECTION 2 - ENGINEERING DATA

- 2.1 Design: The as-built plans, including various boring logs, were available for preparation of this section. A complete geologic report was not provided. There were no rock outcrops in the vicinity of the dam; however, the bedrock in this area is of Cambrian age, specifically the Rome formation. This formation is characterized by variegated shale and sandstone with dolomite. The as-built plans show that test borings drilled before the design of the dam range in depth from 5 to 20 feet. The soils are described as silty, clayey loam characterized in areas by sand and gravel. The bedrock encountered was predominantly shale.

This modified homogeneous earthfill dam was designed by N.W. Wilson of the SCS in 1955. The as-built plans indicate that borrow for the embankment was taken from the reservoir area and the slope above the emergency spillway. The as-built plans show a core wall averaging 7 feet in height above the keyway running along the centerline of the dam. The downstream embankment slope is 2.5H:1V and is cut by a 10 foot wide bench at approximate elevation 1442.6 feet M.S.L. There were no laboratory data or analyses available for review. Other design specifications for the dam were confirmed in the field. The as-built plans show a top of dam elevation of 1467.0 feet M.S.L. (settled height). Surveys conducted as part of the inspection showed a minimum top of dam elevation 0.4 foot above this figure. The higher elevation was used in the hydraulic analyses of the dam for this report. A general description of the dam and appurtenances is given in Section 1.2.1. Portions of the as-built plans are presented in Appendix I.

- 2.2 Construction: The dam was completed in 1956. Construction records were not available for this inspection; however, the as-built drawings were reviewed and were verified in the field.
- 2.3 Evaluation: The as-built drawings were useful in evaluating the structural stability of the dam; however, additional stability analyses would have been more helpful. The assessments made in this report are based upon the design data, field observations, and office analyses. The construction logs were not available for review; however, the as-built drawings indicate any changes or modifications that were made during construction.

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SECTION 3 - VISUAL INSPECTION

3.1 Findings

3.1.1 General: The field inspection was conducted on 27 November 1979. The pool was at elevation 1432.7 feet M.S.L.; the tailwater elevation was 1412.0 feet M.S.L. The weather was sunny and mild, with temperatures in the mid-60's°F. The ground surface at the embankment and abutments was generally dry. The dam and appurtenant structures at the time of inspection were found to be in good overall condition. Deficiencies found during the inspection are not believed to indicate any major stability problems, although they will require remedial treatment. The following are brief summaries of deficiencies found during the inspection. A Field Sketch of conditions is shown as Plate 1. The complete visual inspection check list is given in Appendix III. The Headwaters Soil and Water Conservation District conducts a yearly inspection of the dam with the assistance of the District Conservationist. No inspection reports were available for review.

3.1.2 Dam: The embankments were found to be in generally good condition with no surface cracks or unusual movement at or beyond the toe. The upstream embankment surface appeared to be somewhat irregular, as if the embankment had not been properly smoothed during construction. There is a slight slough midway up this face and another larger slough on the left side near the waterline. The berm on the upstream face, just above the lake level, is damp and marshy most of the way across the embankment. There are tire tracks on this berm from the right abutment to a point opposite the principal spillway intake. The downstream embankment has one berm. There is a line of vegetation change, extending most of the way across the embankment, located below this berm.

There are slight erosion gullies forming in the upstream and downstream junctions of the embankment and the left abutment. The right upstream abutment has a marshy area located slightly above the waterline. On the right

NAME OF DAM: SOUTH RIVER No. 26

downstream abutment, there is a large area of bare ground with several erosion rills; these join to form one rather extensive erosion gully measuring 1.5 feet to 2 feet deep and 4.5 feet wide in places. There is an additional gully, located at the toe to the left of the principal spillway outlet, which has been formed by flow from an underground spring.

There are some fallen trees between the spillway outlet and the spring water gully. Two animal borrows were observed on the dam, one in the center of the upstream embankment, and one on the left side of the downstream embankment below the berm.

- 3.1.3 Appurtenant Structures: The principal spillway is a 24 inch corrugated metal pipe encased in concrete. The concrete appears to be in good condition. The intake structure is covered by a 9.5 foot by 9.5 foot wooden platform accessible by planks stretched from shore. The outlet structure is surrounded by riprap and the stilling basin is lined with riprap.

An access road and power poles are located within the emergency spillway. The channel is grassy and well shaped. There is a stream which merges with the approach channel entrance and a series of staff gages, increasing by 5 foot intervals, located at the junction.

The emergency gate, an 18 inch slide head gate, is located on the upstream face of the riser. It was recently operated and performed adequately.

- 3.1.4 Reservoir Area: The left side of the reservoir is gradually sloped and wooded. The right slope is also gradual and the access road continues along this side to houses located above and along the reservoir. Some sedimentation was observed at the upstream end of the reservoir but it does not appear sufficient to affect the operation of the reservoir.

- 3.1.5 Downstream Channel: The stilling basin is riprapped and well defined. The channel

NAME OF DAM: SOUTH RIVER No. 26

itself is clear and the overbanks are vegetated by trees and brush. There are several homes in the floodplain between 1 and 2 miles below the dam.

3.1.6 Instrumentation: Instrumentation at the dam consists of a series of staff gages, increasing in 5 foot intervals, located along the entrance to the emergency spillway approach channel. No other instrumentation was found at the dam site.

3.2 Evaluation: The dam is generally in good condition. The major deficiencies to be corrected are the areas showing signs of erosion and sloughing, specifically the junctions of the embankment and left abutments, the lower left portion of the upstream face, and the right downstream abutment. The animal burrows in the embankment should be filled. It is recommended that vehicular traffic be restricted to the access road. The staff gages are approximately 25 years old and should be replaced. The fallen trees along the toe of the dam should be removed.

NAME OF DAM: SOUTH RIVER No. 26

SECTION 4 - OPERATIONAL PROCEDURES

- 4.1 Procedures: Operation of the reservoir is an automatic function maintained by the principal spillway crest and the emergency spillway. Water entering the reservoir flows into the principal spillway at elevation 1432.0 feet M.S.L. When the inflow is sufficient, the reservoir level rises above elevation 1460.5 feet M.S.L. and discharges through the emergency spillway.
- 4.2 Maintenance of Dam: The Headwaters Soil and Water Conservation District is responsible for maintenance of the dam. The maintenance responsibilities include liming, fertilizing, and cutting the embankment and spillway; seeding and mulching bare areas; painting the trash rack; and repairing gullies that occur in the dam and spillway areas.
- 4.3 Maintenance of Operating Facilities: The Headwaters Soil and Water Conservation District is responsible for the maintenance of the trash rack and the emergency drawdown facilities.
- 4.4 Warning System: At the present time, there is no formal warning system or evacuation plan in operation.
- 4.5 Evaluation: Maintenance of the dam is considered adequate. Since there are several homes in the damage area, a flood warning system and emergency action plan should be developed and put into operation.

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NAME OF DAM: SOUTH RIVER No. 26

SECTION 5 - HYDRAULIC/HYDROLOGIC DATA

- 5.1 Design: No design data were available for use in preparing this report.
- 5.2 Hydrologic Records: No rainfall, stream gage, or reservoir stage records are maintained for this dam.
- 5.3 Flood Experience: No information on past flooding was available.
- 5.4 Flood Potential: The Probable Maximum Flood (PMF) and the 1/2 Probable Maximum Flood (1/2 PMF) were developed and routed through the reservoir by use of the HEC-1 DB computer program (Reference 9, Appendix IV) and appropriate unit hydrograph, precipitation, and storage-outflow data. Clark's T and R coefficients for the local drainage areas were estimated from basin characteristics. The rainfall applied to the unit hydrograph was taken from a publication by the National Oceanic and Atmospheric Administration (Reference 17, Appendix IV). An initial loss of 1.0 inch and a loss rate of 0.05 inch per hour were used for the PMF and 1/2 PMF.
- 5.5 Reservoir Regulation: Pertinent dam and reservoir data are shown in Table 1.1, Paragraph 1.3.3.

Regulation of flow from the reservoir is automatic. Normal flows are maintained by the crest of the riser, elevation 1432.0 feet M.S.L. Water also flows past the dam through the ungated, vegetated emergency spillway in the event water in the reservoir rises above an elevation of 1460.5 feet M.S.L.

Outlet discharge capacity was computed by hand, reservoir area was planimetered from the as-built plans, and storage capacity was computed by the HEC-1 program. All flood routings were begun with the reservoir at normal pool. Flow from the principal spillway was used in the routings.

- 5.6 Overtopping Potential: The probable rise of the reservoir and other pertinent information on reservoir performance are shown in the following table:

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NAME OF DAM: SOUTH RIVER No. 26

TABLE 5.1 RESERVOIR PERFORMANCE

Item	Normal(a)	Hydrographs	
		1/2 PMF	PMF(b)
Peak flow, c.f.s.			
Inflow	25	6452	12,904
Outflow	25	6154	12,894
Peak elev., ft. M.S.L.	1432.7	1467.26	1468.96
Emergency spillway (c) (elev. 1460.50 feet M.S.L.)			
Depth of flow, ft.	-	6.8	8.5
Average velocity, f.p.s.	-	12.1	13.5
Duration of flow, hrs.	-	13.0	19.2
Non-overflow section (c) (elev. 1467.4 ft. M.S.L.)			
Depth of flow, ft.	-	-	1.6
Average velocity, f.p.s.	-	-	5.9
Total duration of over- topping, hrs.	-	-	2.8
Tailwater elev., ft. M.S.L.	1412.0	-	-

- (a) Conditions at time of inspection.
- (b) The PMF is an estimate of flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in a region.
- (c) Velocity estimates were based on critical depth at control section.
- 5.7 Reservoir Emptying Potential: An 18 inch slide head gate on the upstream face of the riser is available to dewater the reservoir. Neglecting inflow, the reservoir can be drawn down from normal pool in approximately 2.5 days. This is equivalent to an approximate drawdown rate of 5.8 feet per day, based on the hydraulic height measured from normal pool divided by the time to dewater the reservoir.
- 5.8 Evaluation: South River No. 26 is an "intermediate" size - "high" hazard dam requiring evaluation for a spillway design flood (SDF) equal to the PMF. The PMF was routed through the reservoir and found to overtop the dam by a maximum depth of 1.6 feet with an average critical velocity of 5.9 f.p.s. Total duration of dam overtopping would be approximately 2.8 hours. The spillway is capable of passing up to 50 percent of the PMF.

Conclusions pertain to present day conditions and the effect of future development on the hydrology has not been considered.

NAME OF DAM: SOUTH RIVER No. 26

SECTION 6 - DAM STABILITY

- 6.1 Foundation and Abutments: The only information available on foundation conditions consists of the various boring logs included with the as-built plans. The dam is located in the Blue Ridge geologic region of Virginia. The predominant deposit in the area is the Cambrian Age Harpers Formation. According to the as-built plans, the dam has a drainage system consisting of an 8 inch perforated corrugated metal pipe surrounded by a porous filter of river run sand and gravel. The dam has a keyway and core wall of impervious material. The predominant foundation materials are quartz-chlorite-sericite phyllite with thin-to-massive interlayers of metamorphosed sandstone.
- 6.2 Embankment:
- 6.2.1 Material: The only information available on the nature of the embankment material consists of boring logs from the borrow areas. The area soils are generally silty, clayey loams characterized in areas by sand and gravel.
- 6.2.2 Stability: There are no available stability calculations. The dam is 57.4 feet high and 18 feet wide. It has measured upstream and downstream slopes of 2.5H:1V. There is a 10 foot wide berm on both the upstream and downstream embankments. The dam exists at normal pool with a freeboard of 28.5 feet. The dam has never been subjected to a maximum storage pool. The dam is subjected to a sudden drawdown because the approximate reservoir drawdown rate of 5.8 feet per day exceeds the critical drawdown rate of 0.5 foot per day for earth dams.
- 6.2.3 Seismic Stability: South River No. 26 Dam is located in Seismic Zone 2. Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, the dam is considered to have no hazard from earthquakes provided static stability conditions are satisfactory and conventional safety margins exist.
- 6.3 Evaluation: There is insufficient information to adequately evaluate the stability of the dam. During the visual inspection, two sloughs were found on the upstream embankment, there was a line of vegetation change on the downstream embankment, and the right

NAME OF DAM: SOUTH RIVER No. 26

upstream abutment had a marshy area located slightly above the waterline. It is therefore required that a stability check be performed for this dam.

Despite the inability of the spillway to pass the design flood (as described in Section 5 of this report), the depth, duration, and rate of overtopping flows are not considered detrimental to the embankment. Overtopping flows are shallow, last less than 3 hours, and the velocity is less than 6 f.p.s., the effective eroding velocity for a vegetated earth embankment.

NAME OF DAM: SOUTH RIVER No. 26

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

- 7.1 Dam Assessment: The dam and appurtenant structures are generally in good overall condition. Maintenance of the dam is considered adequate. Data available for review were not sufficient to assess the stability of the dam, therefore, a stability check is required. No deficiencies were discovered during the field inspection and office analysis which would indicate the need for emergency attention. Minor to moderate erosion is beginning to occur in various areas on the embankment and abutments. There are two animal burrows on the embankment.

Using the Corps of Engineers' screening criteria for initial review of spillway adequacy, the PMF was selected as the SDF for the "intermediate" size - "high" hazard classification of South River No. 26 dam. It has been determined that the dam would be overtopped by the SDF by a maximum depth of 1.6 feet with an average critical velocity of 5.9 f.p.s. and would remain above the top of the dam for 2.8 hours. The spillway is capable of passing up to 50 percent of the PMF.

Despite the inability of the spillway to pass the design flood, the depth, duration, and rate of overtopping flows are not considered detrimental to the embankment. Overtopping flows are shallow, last less than 3 hours, and the velocity is less than 6 f.p.s., the effective eroding velocity for a vegetated earth embankment.

The spillway is adjudged as inadequate, but not seriously inadequate.

There is no flood warning system or emergency action plan currently in operation.

The other recommended remedial measures are not considered urgent and therefore may be accomplished as part of the annual maintenance and inspection program.

- 7.2 Recommended Remedial Measures: Since there are several homes in the damage area, a flood warning system and emergency action plan should be developed and put into operation.

A stability check is required to adequately assess the stability of the dam.

NAME OF DAM: SOUTH RIVER No. 26

The following repair items should be completed as part of the general maintenance of the dam:

- 1) Excavate, fill, and compact the animal burrows.
- 2) Grade and seed all areas on the embankment and abutments where erosion has occurred.
- 3) Remove the fallen trees along the toe of the embankment to the left of the stilling basin.
- 4) Replace the staff gages used to monitor reservoir levels above normal pool.

NAME OF DAM: SOUTH RIVER No. 26

APPENDIX I

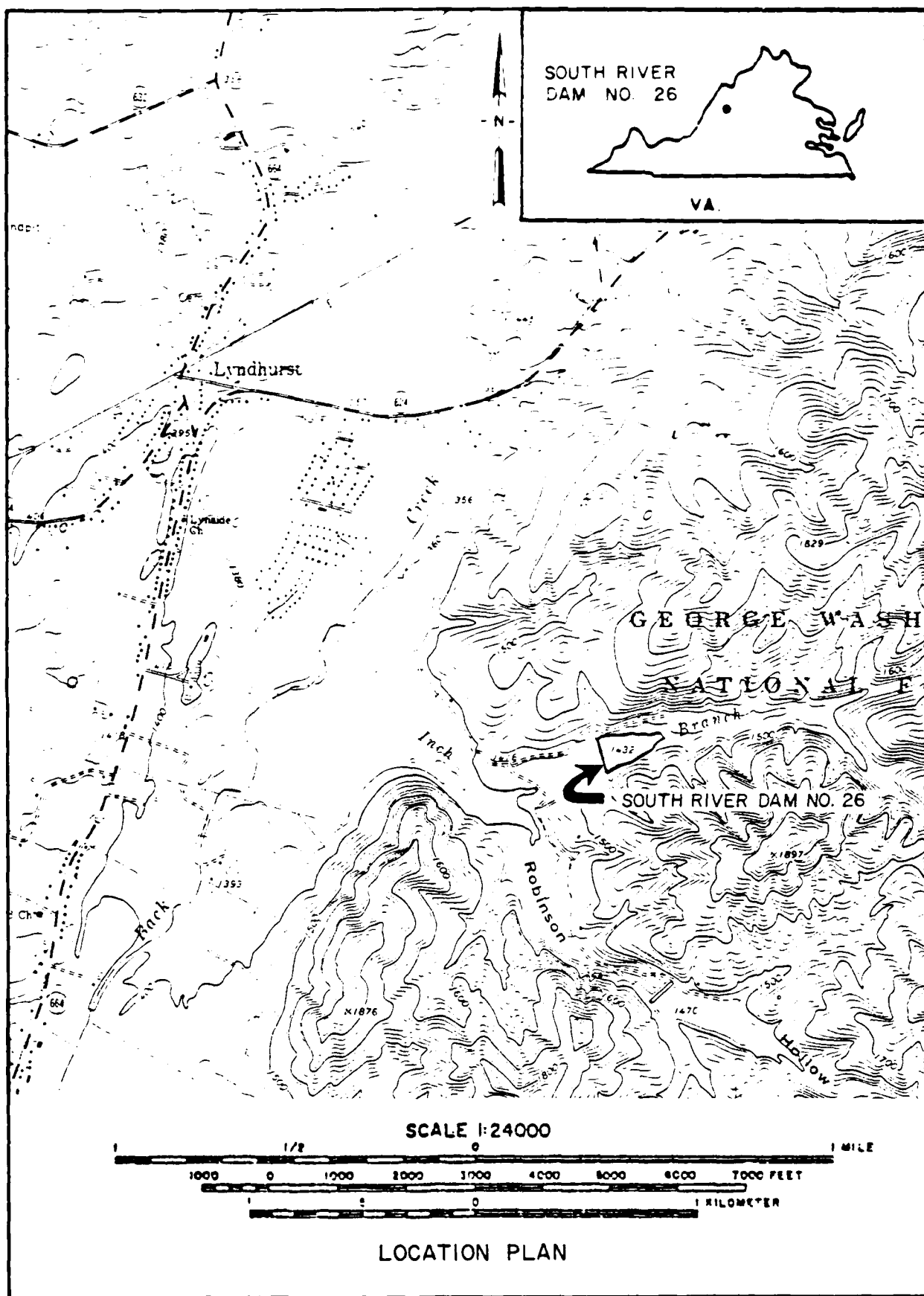
PLATES

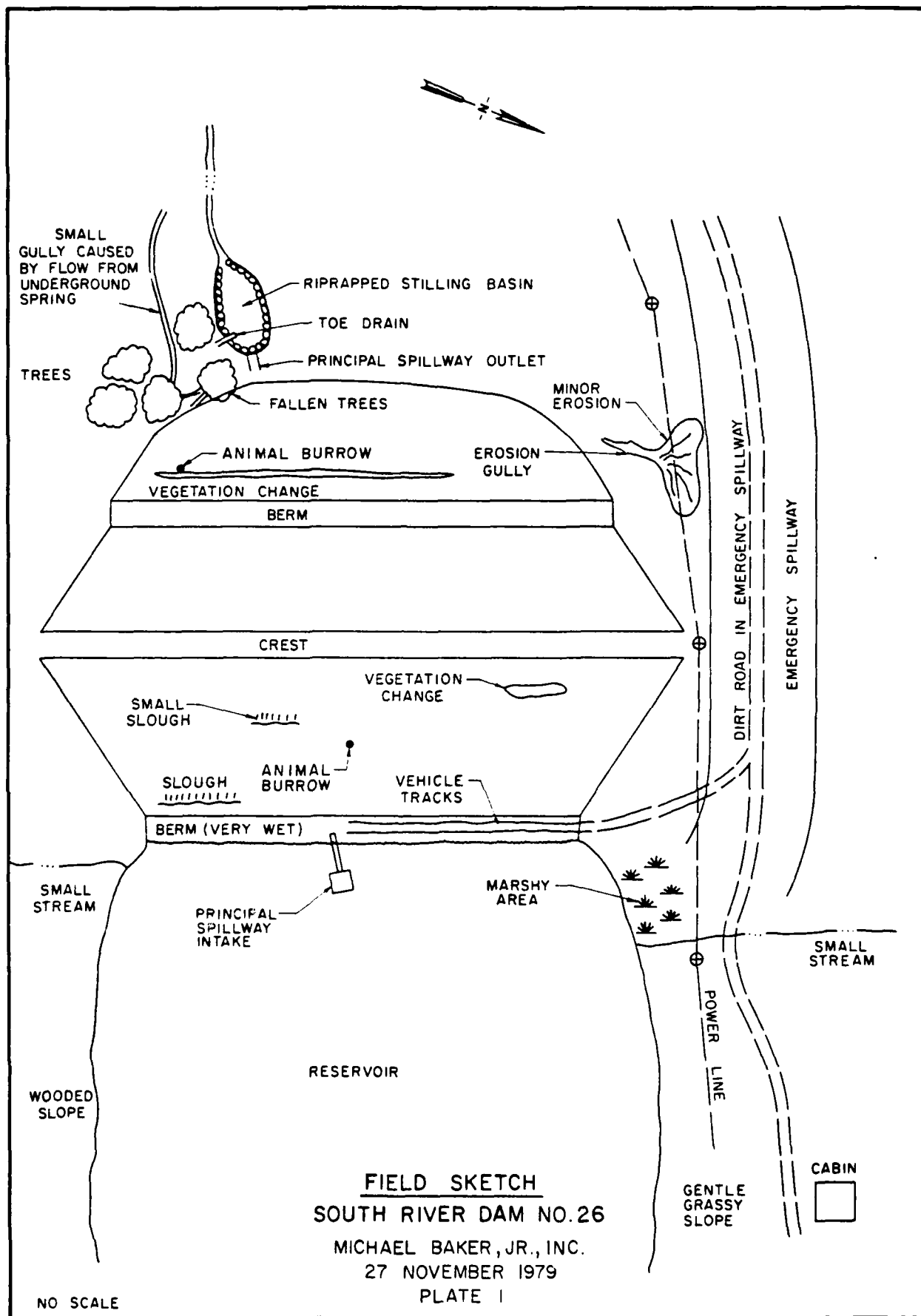
CONTENTS

Location Plan

- Plate 1: Field Sketch
- Plate 2: Plan of Dam (from as-builts)
- Plate 3: Profile along Centerline of Dam (from as-builts)
- Plate 4: Section along Centerline of Principal Spillway
(from as-builts)
- Plate 5: Emergency Spillway Profiles (from as-builts)
- Plate 6: Emergency Spillway Cross-Sections (from as-builts)
- Plate 7: Details of Three Foot by Three Foot Reinforced
Concrete Riser (from as-builts)
- Plate 8: Details of Anti-Vortex Baffle and Headgate
(from as-builts)

NAME OF DAM: SOUTH RIVER No. 26



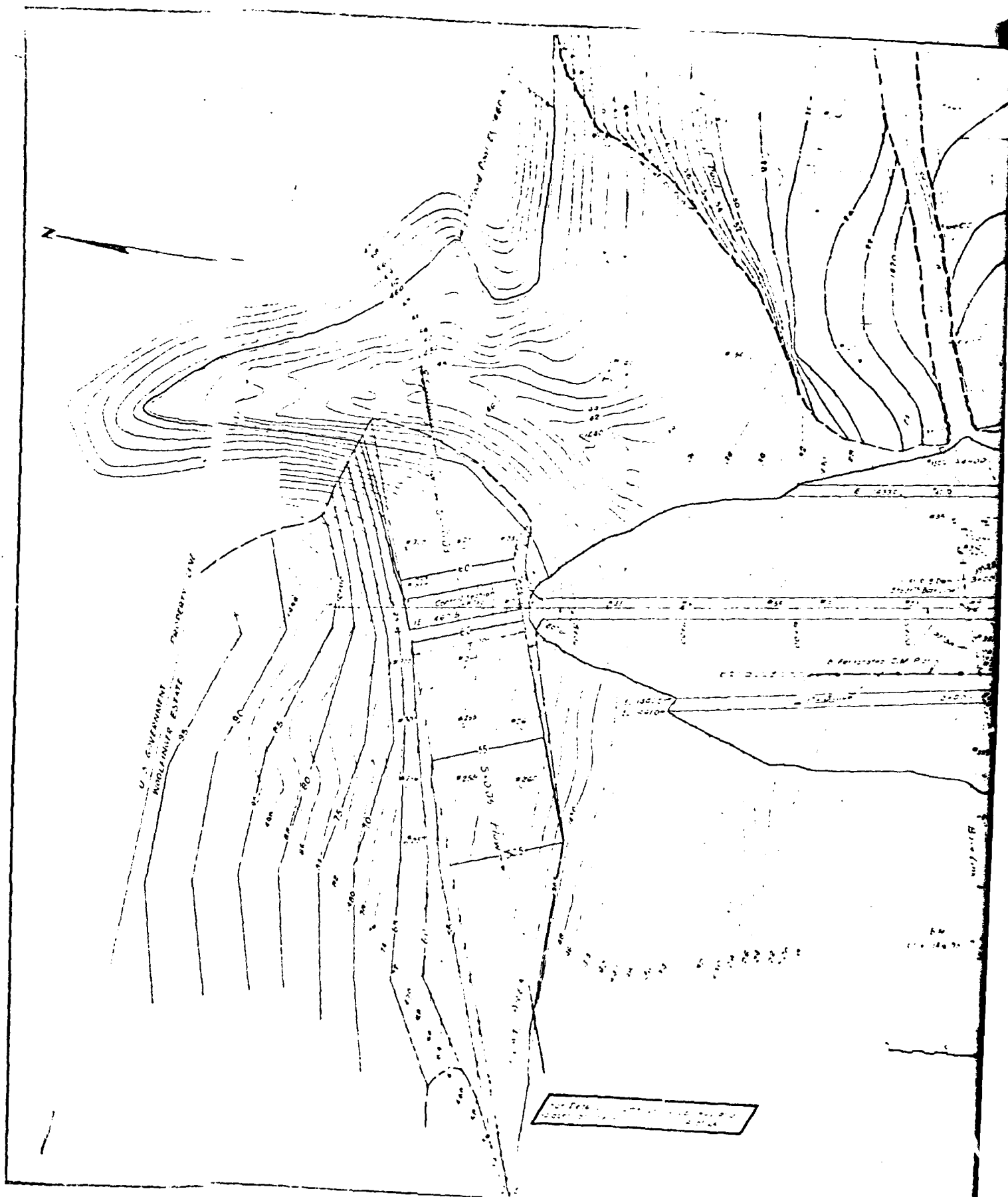


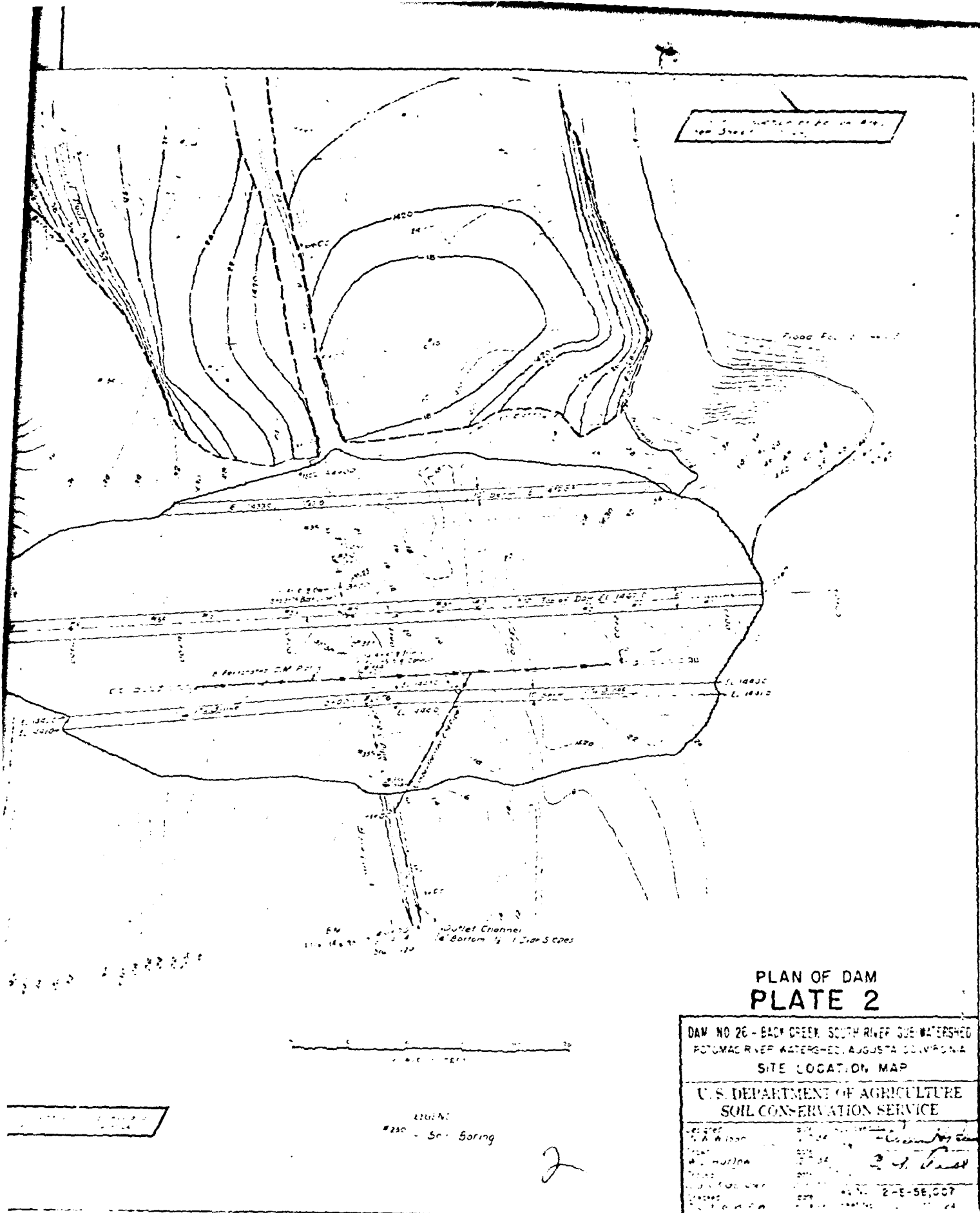
FIELD SKETCH
SOUTH RIVER DAM NO. 26

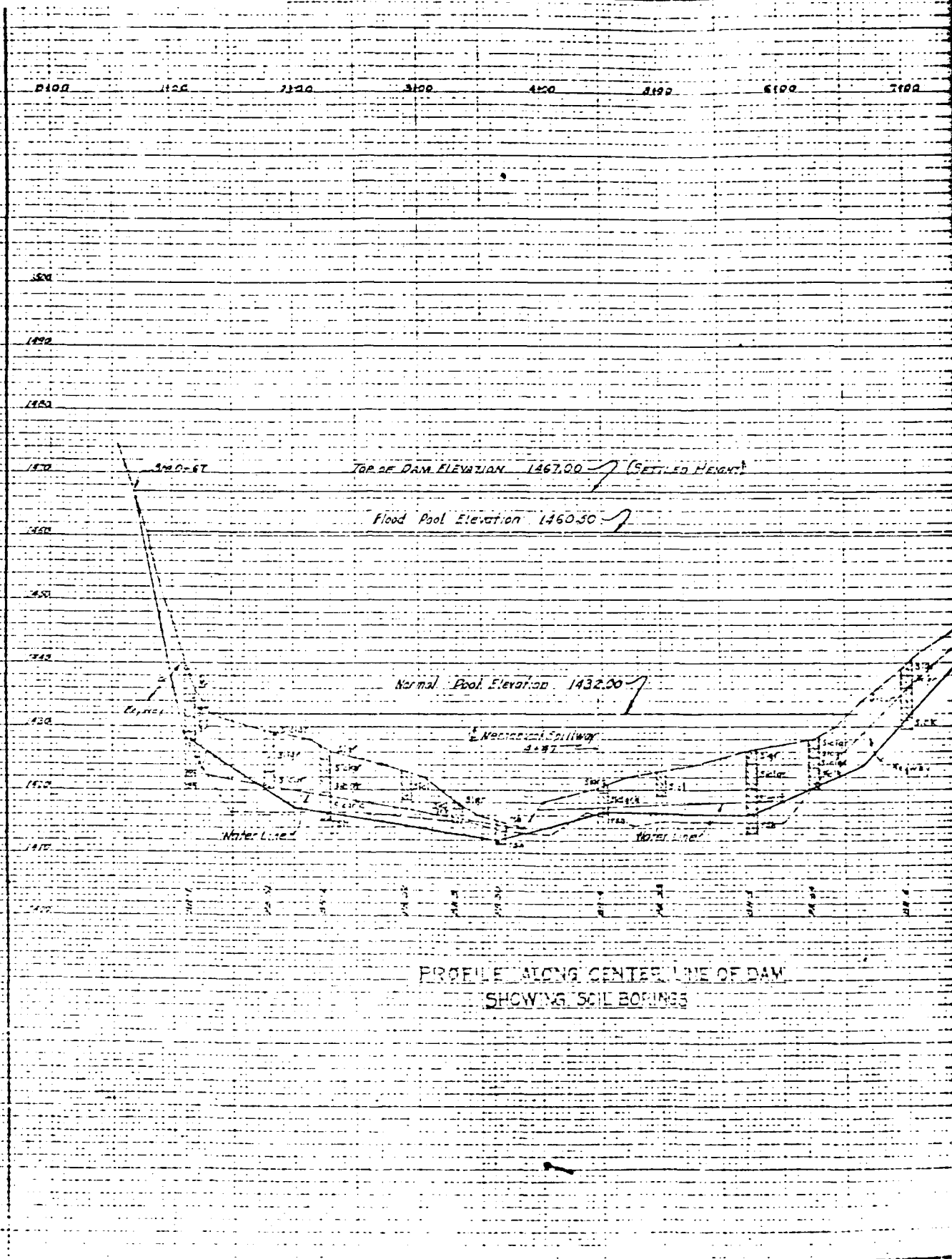
MICHAEL BAKER, JR., INC.

27 NOVEMBER 1979

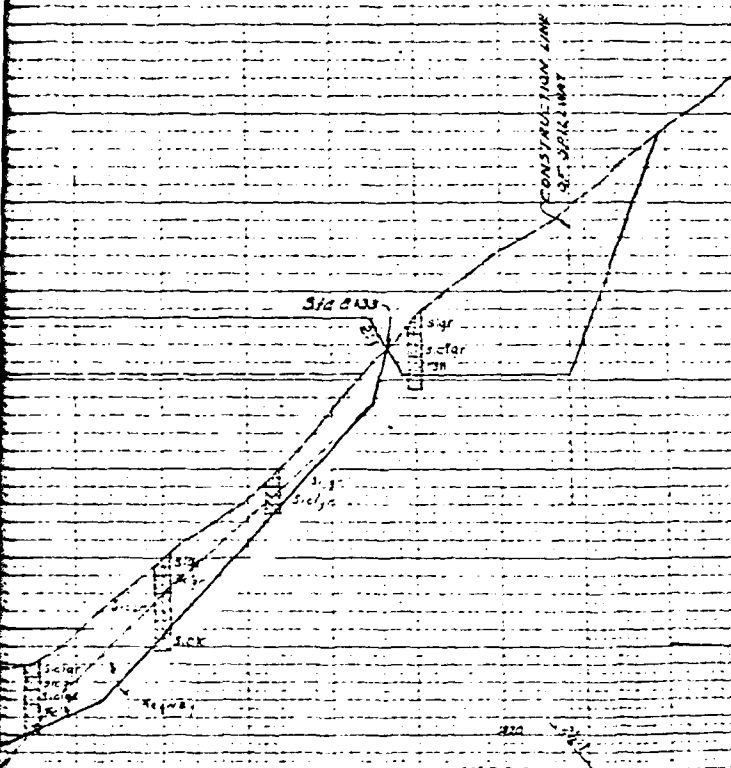
PLATE I







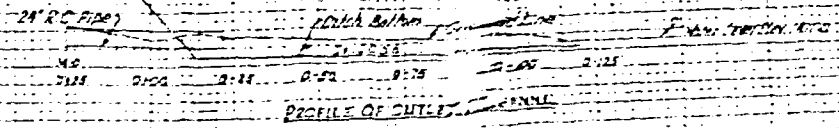
7100 8100 9000 10000 11000



SOIL LEGEND

- 1 - Sandy Loam
- 2 - Clay Loam
- 3 - Sandy Clay Loam
- 4 - Silty Clay Loam
- 5 - Silty Clay
- 6 - Gravelly
- 7 - Shale
- 8 - Cobble

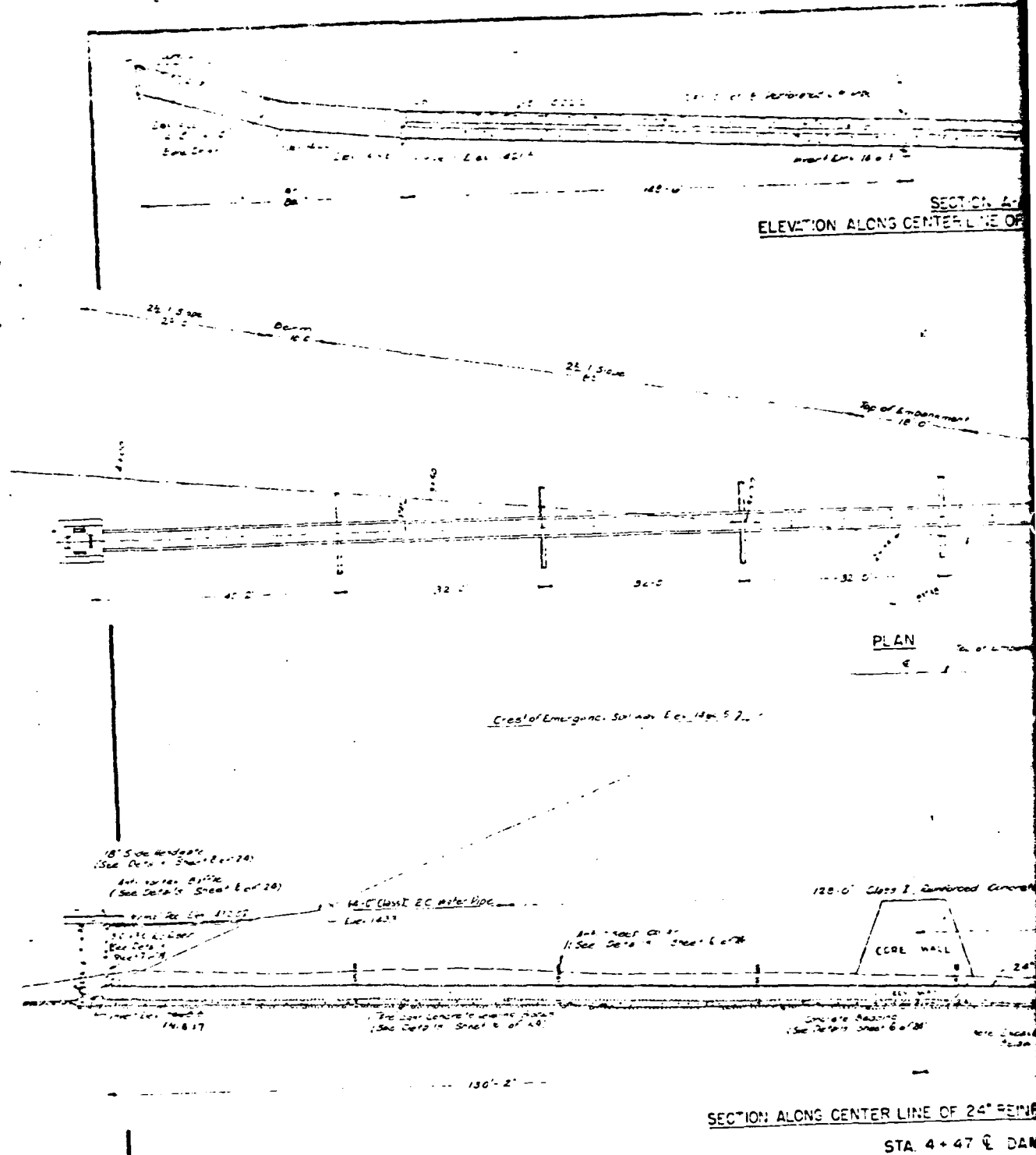
- 9 - Sand
- 10 - Silt
- 11 - Clay
- 12 - Shale
- 13 - Sandstone



PROFILE ALONG CENTERLINE
OF DAM

PLATE 3

DAM NO. 25 BLACK CREEK - SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED, AUGUSTA CO., VIRGINIA
PROFILES & CROSS-SECTIONS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



SECTION A-A
SECTION ALONG CENTER LINE OF 8" PERFORATED C.M. PIPE

SECTION 4.4

SECTION E-E

PLAN

120-0' Class I Reinforced Concrete Water Pipe.

LONG CENTER LINE OF 24" REINFORCED CONCRETE PIPE

STA. 4 + 47 @ DAM

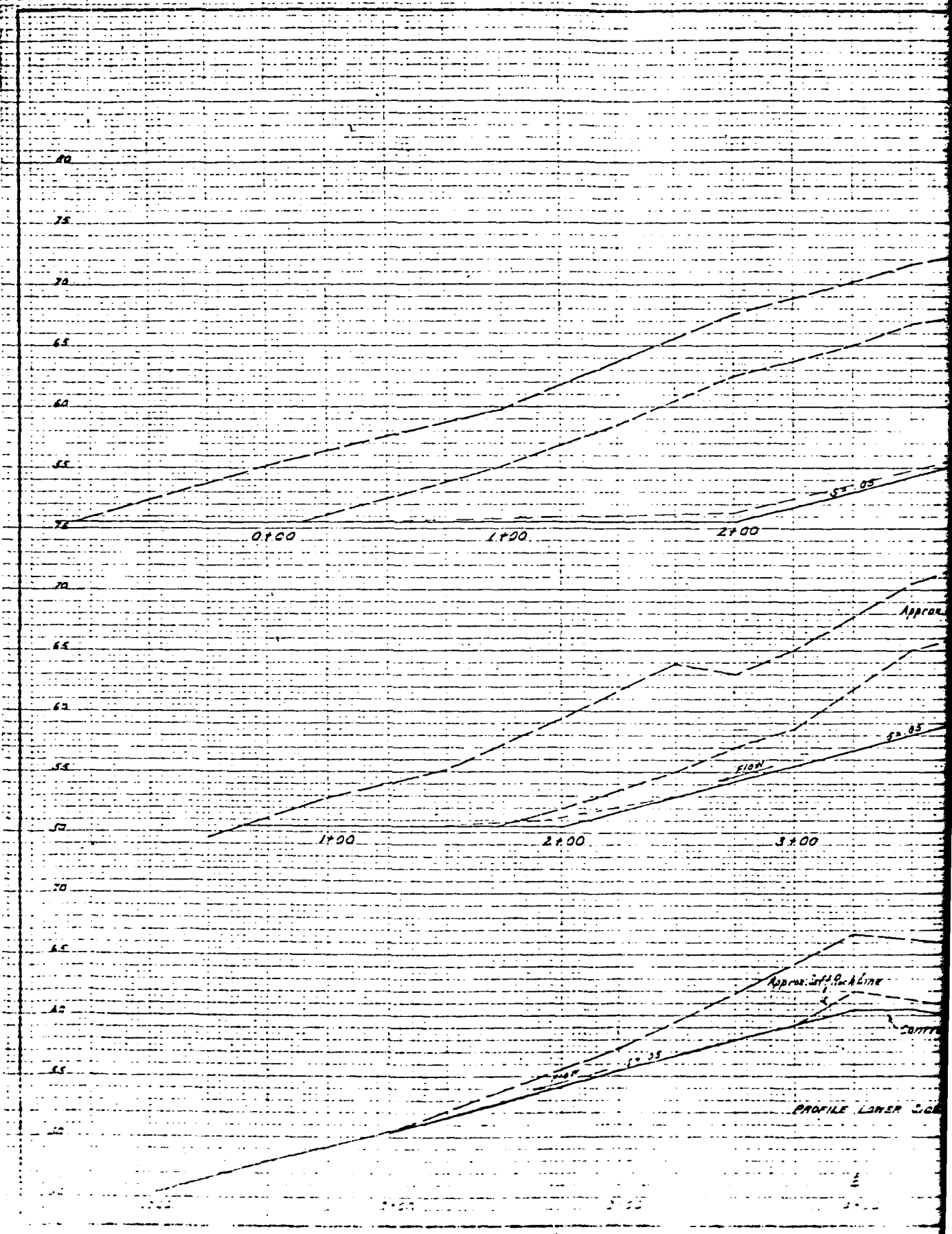
SECTION ALONG CENTERLINE
OF PRINCIPAL SPILLWAY
PLATE 4

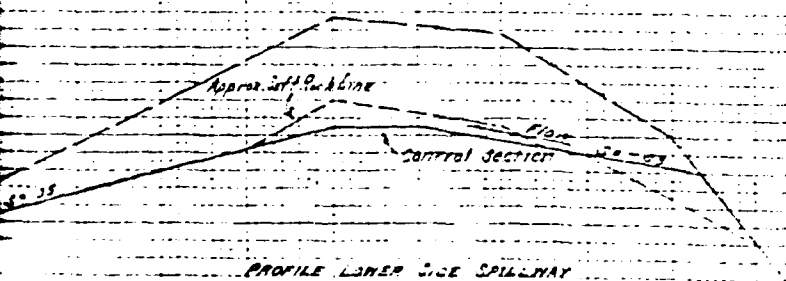
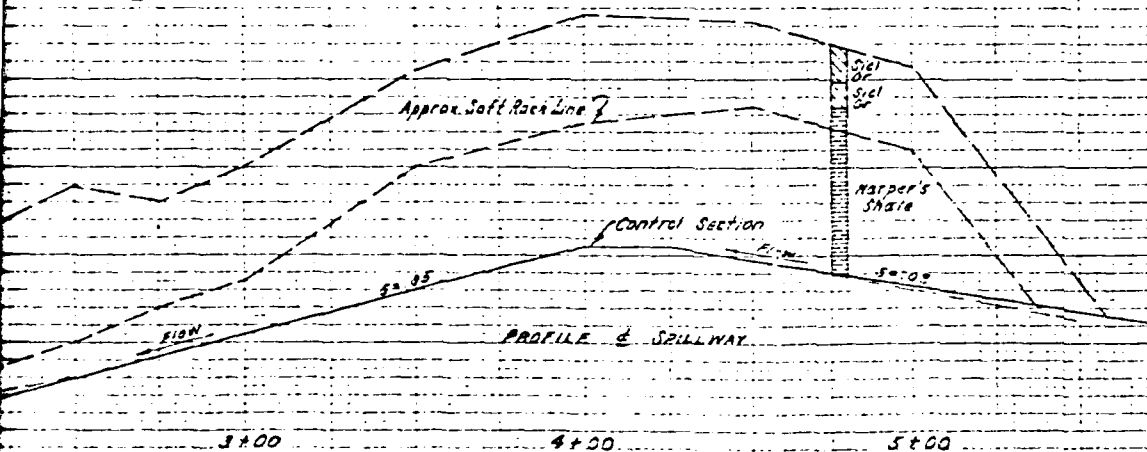
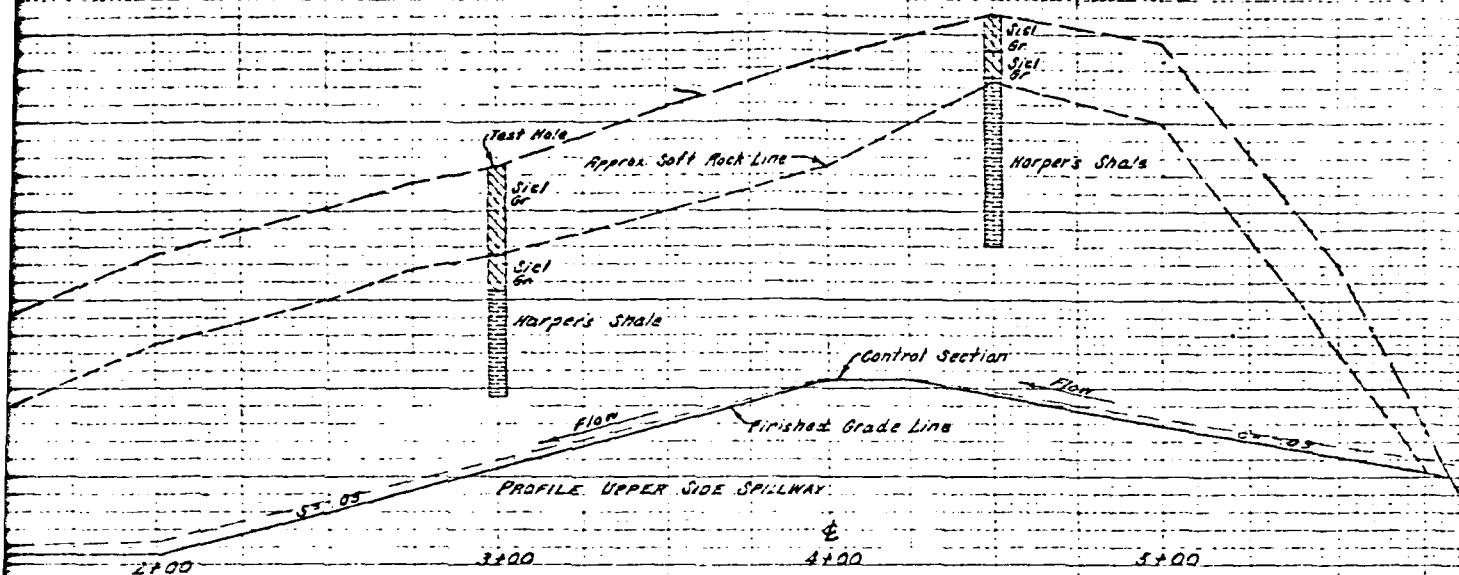
DAM NO 20 - BACK CREEK, SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED, AUGUSTA CO., VIRGINIA
3'-0" 3'-0" DEEP ALUM. - 24" REINFORCED CONCRETE PIPE
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designd	074	Approved By	<i>[Signature]</i>
MALCOLM P. BOGGS	4 8 55		
Drawn	001		
A. F. MURPHY	4 8 55		<i>C. A. [Signature]</i>
Typed	002		
R. H. Smith	5 2 55		
Checked	074	Draw No	2-E-55-000
W. J. B. R. M.	5 2 55	Sheet No	5 of 26

SURVEY
 DATE: 10/10/54
 BY: J. H. [unclear]

SURVEY
 DATE: 10/10/54
 BY: J. H. [unclear]





NOTE: SEE SHEET 24 OF 28 FOR
LEGEND OF SYMBOLS

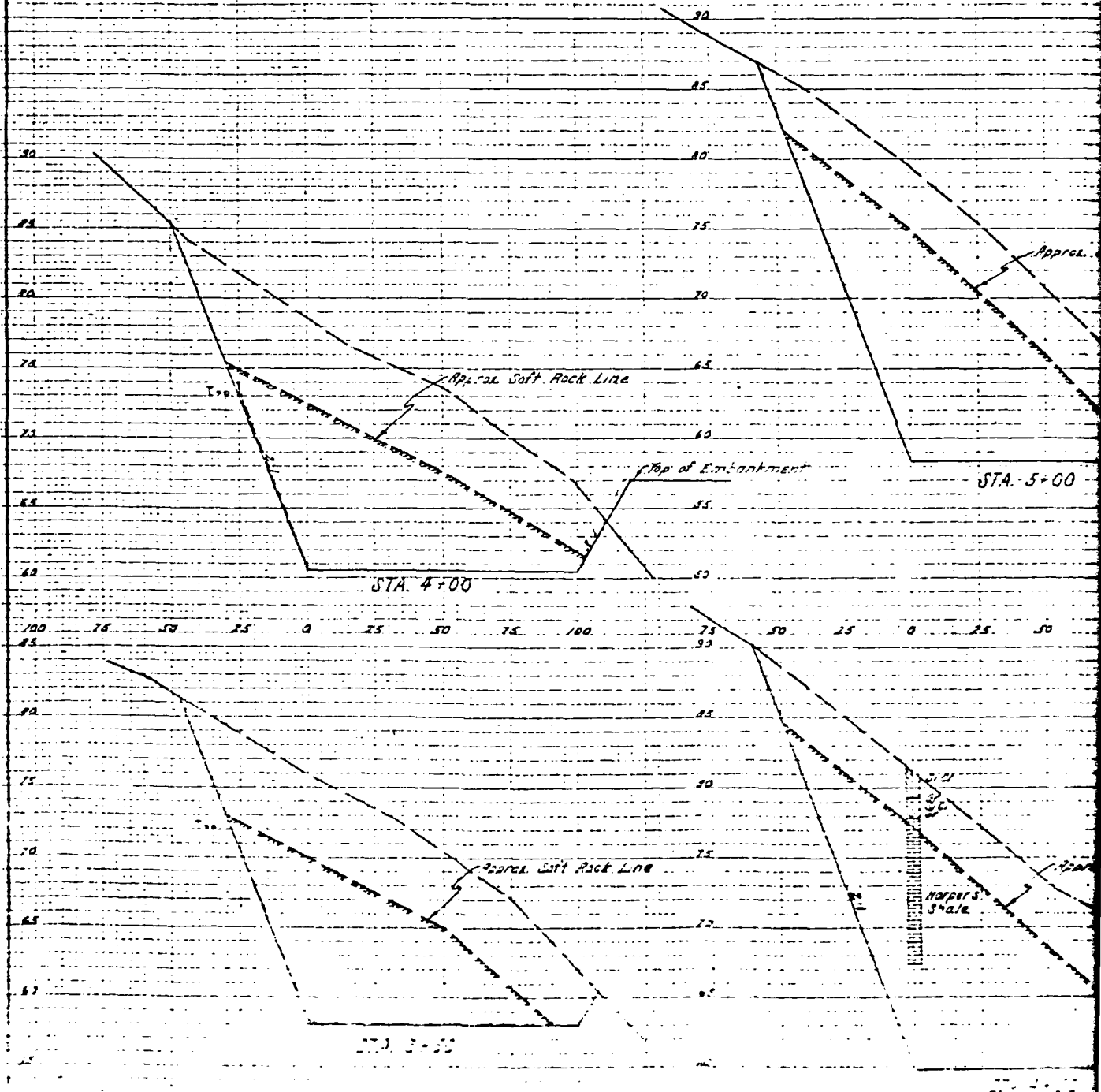
NO. 24

DAM NO. 24 BACK CREEK - SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED, AUGUSTA CO., VIRGINIA
EMERGENCY SPILLWAY PROFILES
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PLATE 5

FINAL SURVEY

FINAL SURVEY



SPILLWAY SECTIONS SHOWN
LOOKING UPSTREAM

ZERO CUT STA. 5+83

Approx. Soft Rock Line

STA. 5+75

STA. 5+00

Approx. Soft Rock Line

STA. 5+50

NOTE:

See Sheet 23 of 24 For Soil Legend

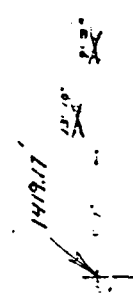
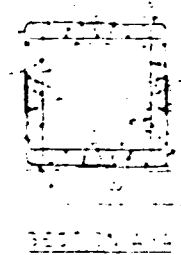
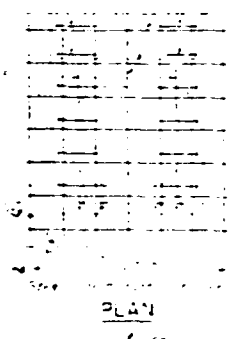
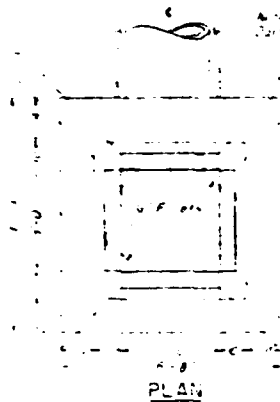
Approx. Soft Rock Line

Ward's
5' dia

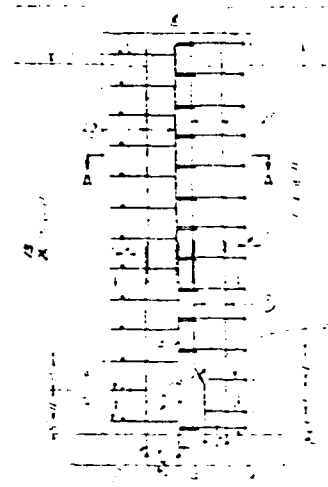
DAM NO. 26 BACK CREEK-SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED, AUGUSTA CO., VIRGINIA
EMERGENCY SPILLWAY CROSS-SECTIONS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by _____
Checked by _____
Date _____
Scale _____
Sheet _____ of _____

PLATE 6

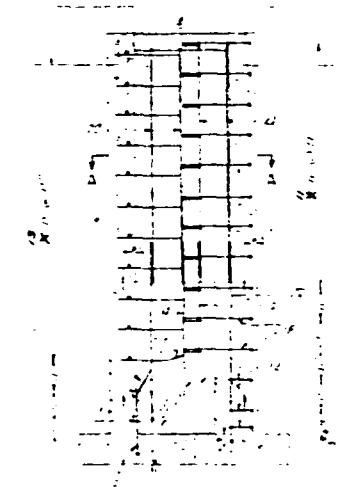


UPSTREAM WALL ELEVATION



UPSTREAM WALL ELEVATION

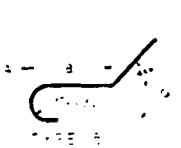
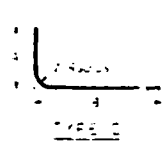
DOWNSTREAM WALL ELEVATION

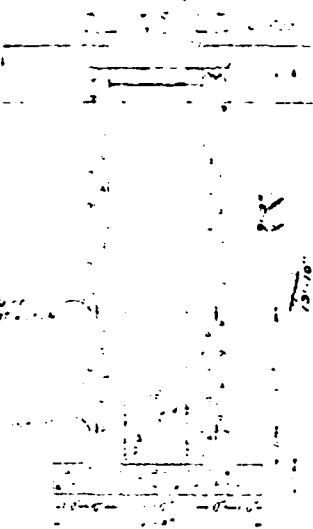


DOWNSTREAM WALL ELEVATION

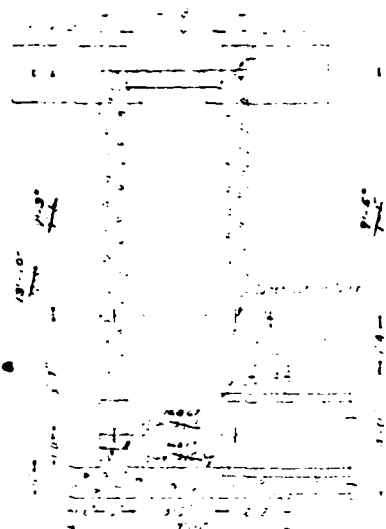
BAR TYPES

REINFORCING

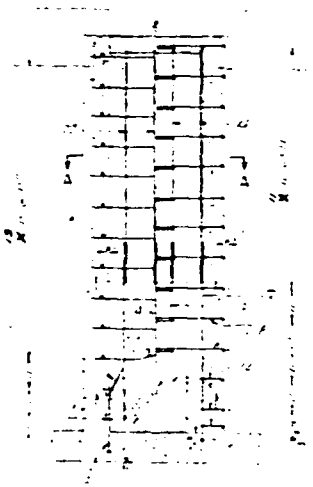




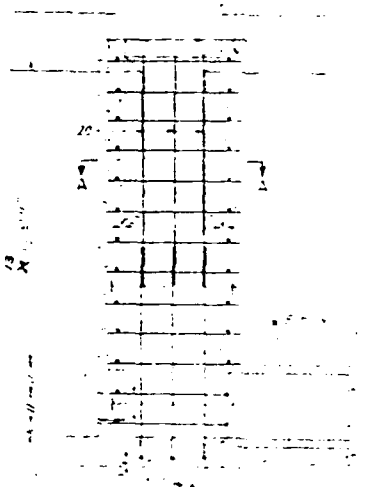
DOWNSTREAM WALL ELEVATION



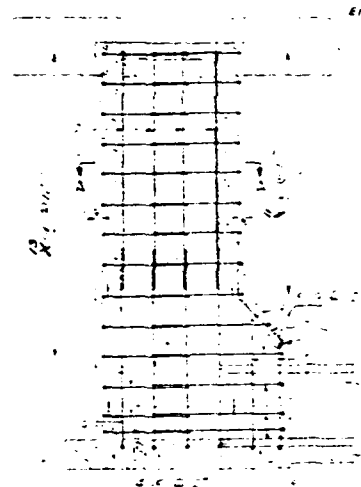
SIDE WALL ELEVATION



DOWNSTREAM WALL ELEVATION



SIDE WALL ELEVATION



SIDE WALL ELEVATION

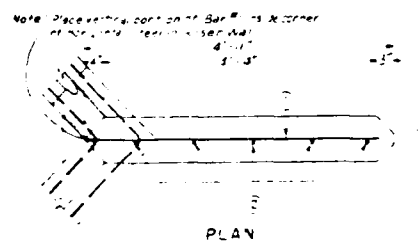
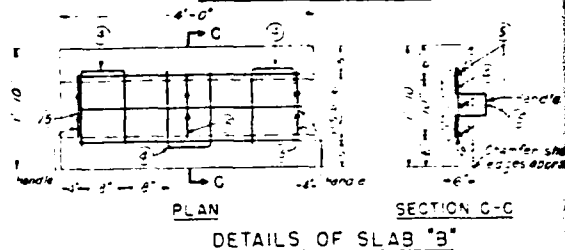
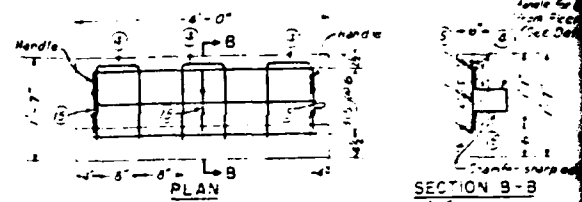
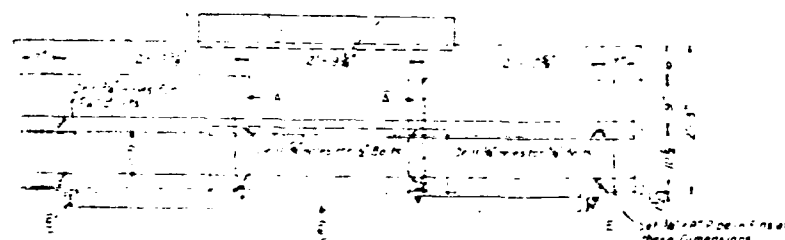
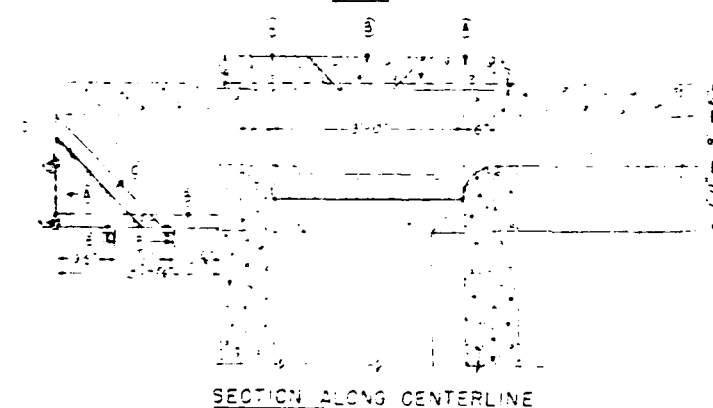
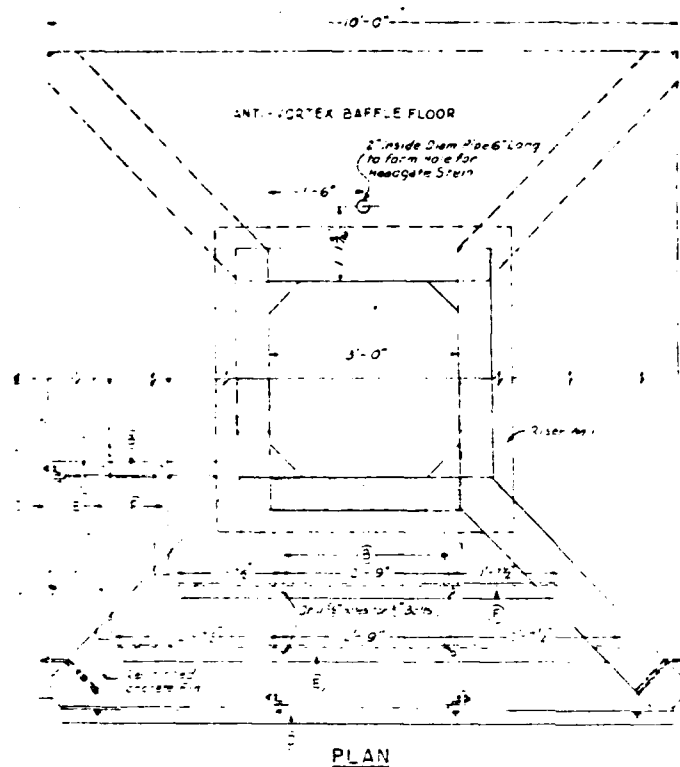
STEEL SCHEDULE FOR RISER					
LOCATION	MARK	SIZE	LENGTH	NO. BARS	TOTAL FEET
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QUANTITIES

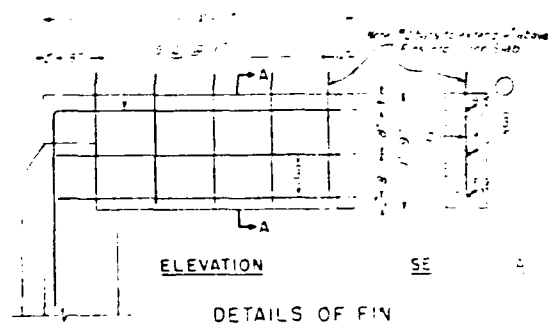
Additional steel required for
Elimination of Bent 23
Sheet Pile 23

"AS BUILT"

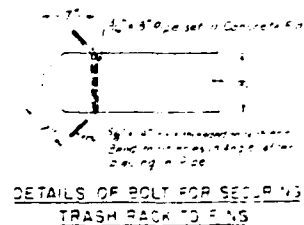
DAM NO. 16 - BACK CREEK, SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED, ALLEGANY CO., VIRGINIA
DETAILS OF 5'-0" x 5'-0" PRESTRESSED CONCRETE RISER
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



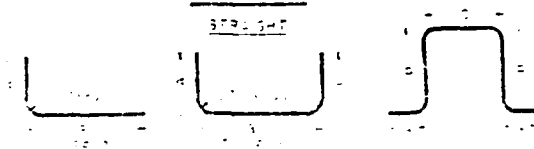
NOTE: Steel And Trash Rack either be as shown

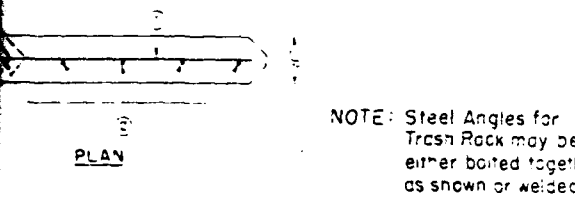
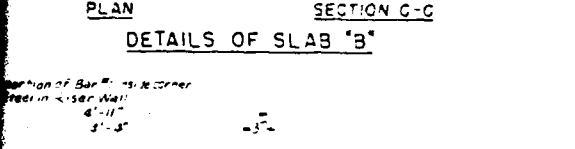
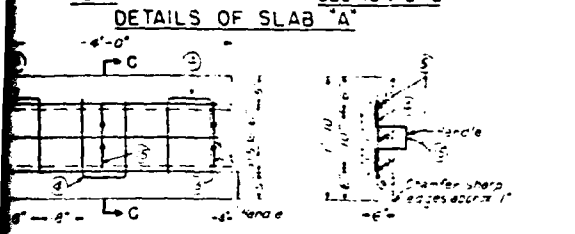
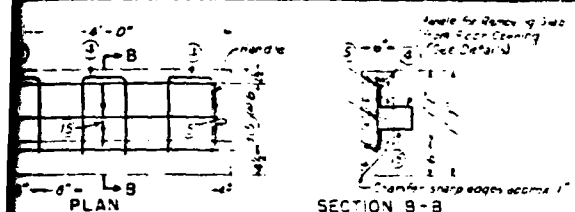


Note: Fins are to be secured in concrete with All concrete corners to be finished

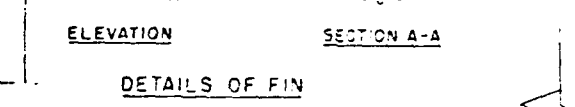
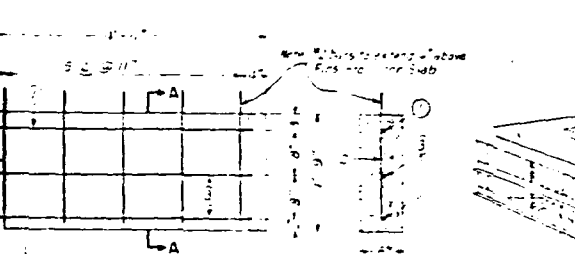


BAR TYPES

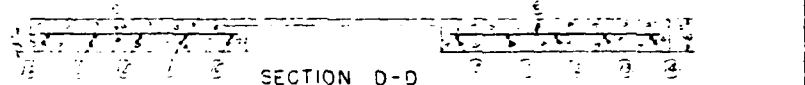
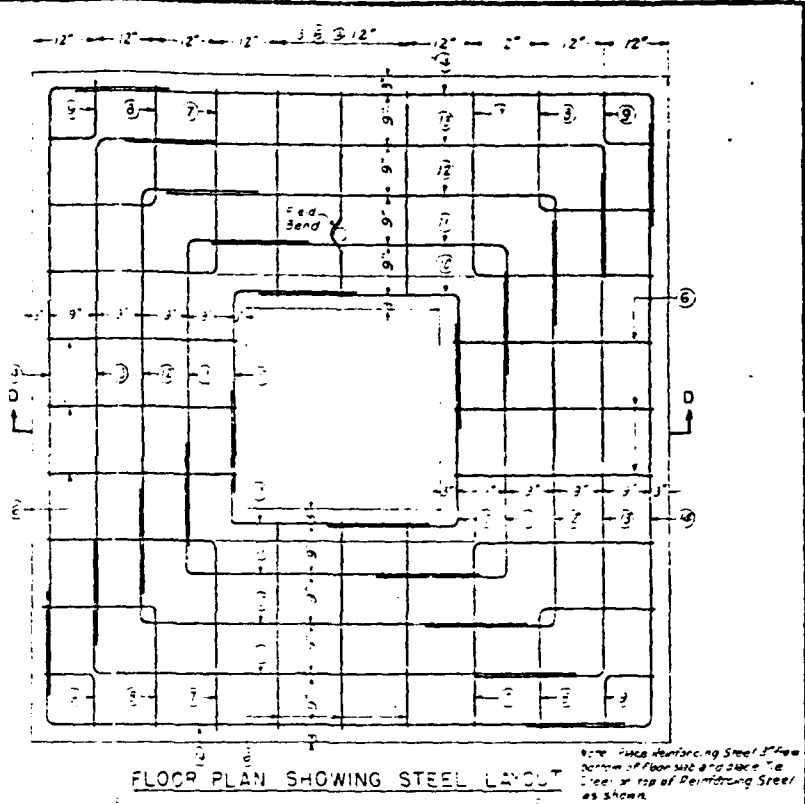
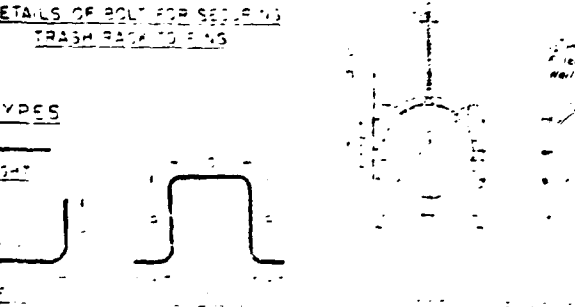
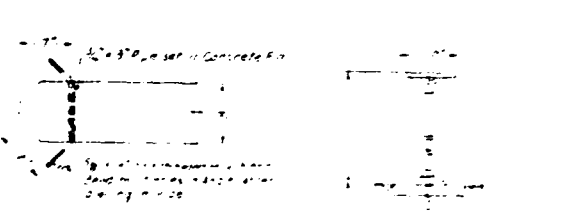




NOTE: Steel Angles for Trash Rack may be either bolted together as shown or welded.



NOTE: Fins are to be secured - in concrete wall with 1/2" bar. All concrete corners to be chamfered 1/2".



STEEL SCHEDULE FOR ANTI-VORTEX BAFFLE									
LOCATION	MARK	SIZE	PLAN LENGTH	TYPE	A	B	C	TOTAL	FEET
1-1	1	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-2	2	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-3	3	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-4	4	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-5	5	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-6	6	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-7	7	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-8	8	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-9	9	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-10	10	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-11	11	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-12	12	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-13	13	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-14	14	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0
1-15	15	4	12'-0"	1	12'-0"	12'-0"	12'-0"	36'-0"	0

QUANTITIES FOR ANTI-VORTEX BAFFLE
Number of Steel Bars 150, 1/2" Bars 120, 1/4" Bars 120, Total 390 Bars

BILL OF MATERIALS FOR TRASH RACK			
ITEM	QUANTITY	UNIT	PRICE
1. Steel Bars 1/2"	150	Bars	1.20
2. Steel Bars 1/4"	120	Bars	0.80
3. Steel Bars 1/2"	120	Bars	1.20
4. Steel Bars 1/4"	120	Bars	0.80
5. Steel Bars 1/2"	120	Bars	1.20
6. Steel Bars 1/4"	120	Bars	0.80
7. Steel Bars 1/2"	120	Bars	1.20
8. Steel Bars 1/4"	120	Bars	0.80
9. Steel Bars 1/2"	120	Bars	1.20
10. Steel Bars 1/4"	120	Bars	0.80

DAM NO 26 - PARK TRUCK SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED - AUGUSTA CO., VIRGINIA
DETAILS OF ANTI-VORTEX BAFFLE & HEADGATE
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

APPENDIX II

PHOTOGRAPHS

CONTENTS

- Photo 1: Principal Spillway Intake
- Photo 2: Principal Spillway Outlet
- Photo 3: View of Downstream Channel
- Photo 4: View from Left Abutment Showing Emergency
Spillway
- Photo 5: Animal Burrow in Downstream Embankment
- Photo 6: Sloughing Area in Lower Left Portion of Upstream
Embankment

Note: Photographs were taken on 27 November 1979.

NAME OF DAM: SOUTH RIVER No. 26

SOUTH RIVER No. 26



PHOTO 1. Principal Spillway Intake



PHOTO 2. Principal Spillway Outlet

SOUTH RIVER No. 26



PHOTO 3. View of Downstream Channel



PHOTO 4. View from Left Abutment Showing Emergency Spillway

SOUTH RIVER No. 26



PHOTO 5. Animal Burrow in Downstream Embankment

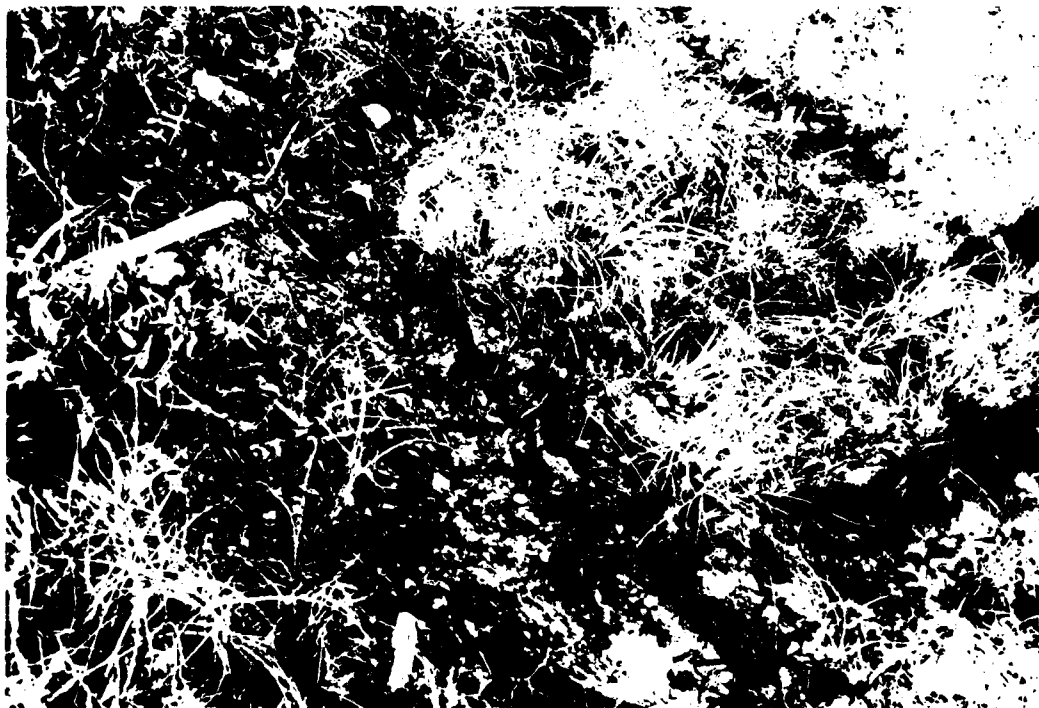


PHOTO 6. Sloughing Area in Lower Left Portion of Upstream Embankment

APPENDIX III

CHECK LIST - VISUAL INSPECTION

Check List
Visual Inspection
Phase 1

Name of Dam South River No. 26 County Augusta State Virginia Coordinates Lat. 3800.9
Long. 7857.1

Date of Inspection 27 November 1979 Weather Sunny Temperature 62° F.

Pool Elevation at Time of Inspection 1432.7 ft. M.S.L. Tailwater at Time of Inspection 1412.0 ft. M.S.L.

HH-1

Inspection Personnel:

Michael Baker, Jr., Inc.:

Jeffrey A. Quay
James A. Kuncelman
Leslie K. Black

Virginia Water Control Board:

Edwin B. Constantine

Soil Conservation Service:

Wayne Hypes

Owner's Representatives:

Artif Fisher

Leslie K. Black Recorder

EMBANKMENT

Name of Dam SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None visible	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	There is a gully located at the toe, to the left of the principal spillway outlet, which has been formed by flow from an underground spring.	There are some fallen trees which should be removed between this gully and the principal spillway outlet.
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	<p>A gully 1.5 to 2 ft. deep and 4.5 ft. wide has formed on the right downstream abutment. There is a large area of bare ground with several erosion rills above this gully. Erosion gullies are beginning to form in the junctions between the left abutment and the upstream and downstream embankments. The right upstream abutment has a marshy area located slightly above the waterline. There is a berm on the upstream embankment just above the waterline. There is a berm approximately halfway up the face of the downstream embankment. There is a small slough in the center of the upstream embankment and a larger slough on the side near the waterline. There is an animal borrow in the center of the upstream embankment and another on the left side of the downstream embankment below the berm.</p>	All areas of erosion should be regraded and reseeded. The animal burrows should be excavated, filled, and reseeded.

EMBANKMENT

Name of Dam SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
RIPRAP FAILURES	The only riprapped areas observed during the inspection were the stilling basin for the principal spillway and around the principal spillway outlet. The riprap appears to be in good condition.	
UPSTREAM EMBANKMENT	The surface of the upstream embankment is fairly irregular with some small slumps. It appears as if the surface may not have been properly smoothed during construction. The berm on the upstream face, just above the lake level, is damp and marshy most of the way across the embankment. There are tire tracks on this berm from the right abutment to a point opposite the principal spillway intake.	
VERTICAL AND HORIZONTAL ALIGNMENT	The horizontal and vertical alignments of the crest are good.	

EMBANKMENT

Name of Dam SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Erosion gullies are beginning to form in the upstream and downstream junctions of the embankment and left abutment. The junction of the spillway and dam appears to be in good condition.	Regrade and reseed the erosion gullies. Protect with riprap if erosion reoccurs.
ANY NOTICEABLE SEEPAGE	There is no noticeable seepage. There is a line of vegetation change along the downstream embankment below the berm, but the ground in this area is dry.	
STAFF GAGE AND RECORDER	There is a series of staff gages located across the emergency spillway approach channel. These gages are in poor condition.	The staff gages should be replaced.
DRAINS	According to the as-built plans, there is a toe drain 540 ft. long under the central portion of the toe. The outlet for this drain is an 8 in. C.M.P. discharging into the left side of the stilling basin. The outlet was located during the inspection and it appears to be in good condition. It was partially submerged during the inspection.	

OUTLET WORKS

Name of Dam: SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Only the downstream end of the outlet conduit, a 24 in. C.M.P. encased in concrete, could be inspected. It appears to be in good condition; there are no signs of concrete deterioration.	
INTAKE STRUCTURE	According to the as-built plans, the intake structure is a 3 ft. by 3 ft. reinforced concrete riser. At the time of the inspection it was completely submerged and could not be inspected. The trash rack, a 9.5 ft. by 9.5 ft. wooden platform atop the riser, has recently been replaced and is in good condition.	
OUTLET STRUCTURE	According to the as-built plans, the outlet structure consists of a concrete sill and reinforced concrete counterweight supporting the outlet conduit. Only the downstream end of the outlet conduit was found during the inspection. It appears to be in good condition. The outlet structure is surrounded by riprap. The riprap is also in good condition.	
OUTLET CHANNEL	The outlet conduit discharges into a riprapped stilling basin, which appears to be in good condition.	

OUTLET WORKS

Name of Dam: SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
EMERGENCY GATE	The emergency gate is an 18 in. slide head gate on the upstream face of the principal spillway riser. The gate is operated from the trash rack located atop the principal spillway riser.	According to the District Conservationist, the emergency gate was operated recently and worked well.

UNGATED SPILLWAY

Name of Dam: SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONTROL SECTION	<p>The control section is 100 ft. wide with side slopes of approximately 2:1. Its invert is at elevation 1460.5 ft. M.S.L. The control section is well covered with relatively short grass.</p>	
APPROACH CHANNEL	<p>The approach channel is well vegetated with fairly short grass. A dirt road, which provides access to cabins along the reservoir, runs along the center of the approach channel. There is a line of small power poles in the approach channel. A small stream enters the reservoir just above the mouth of the approach channel.</p>	
DISCHARGE CHANNEL	<p>The discharge channel is well vegetated. The dirt road and power poles both run along the discharge channel.</p>	
BRIDGE AND PIERS	<p>Not Applicable</p>	

INSTRUMENTATION

Name of Dam: SOUTH RIVER No. 26

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	No bench marks were located in the field.	
OBSERVATION WELLS	None observed	
WEIRS	None observed	
PIEZOMETERS	None observed	
OTHER	A series of staff gages are located across the upstream end of the emergency spillway approach channel. They are in poor condition.	The staff gages should be replaced.

RESERVOIR

Name of Dam: SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The left side of the reservoir is gradually sloped and wooded. The right slope is also gradual and the access road continues along this side from the emergency spillway to houses located above and along the reservoir.	
SEDIMENTATION	Some sedimentation is occurring at the upstream end of the reservoir, but it does not appear sufficient to affect the operation of the reservoir.	

DOWNSTREAM CHANNEL

Name of Dam: SOUTH RIVER No. 26

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	The downstream channel itself is clear but the overbanks are covered with fairly thick trees and brush. The stilling basin is ripped and well defined.	
SLOPES	The side slopes are covered with fairly thick trees and brush. The downstream channel has a slope of approximately 1.7% in the reach immediately below the dam.	
APPROXIMATE NO. OF HOMES AND POPULATION	No inhabited buildings were observed within the first mi. downstream of the dam. There are approximately 10 houses (estimated population 40), between 1 and 2 miles below the dam, which are at low enough elevations to be affected by high water.	

APPENDIX IV

GENERAL REFERENCES

GENERAL REFERENCES

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